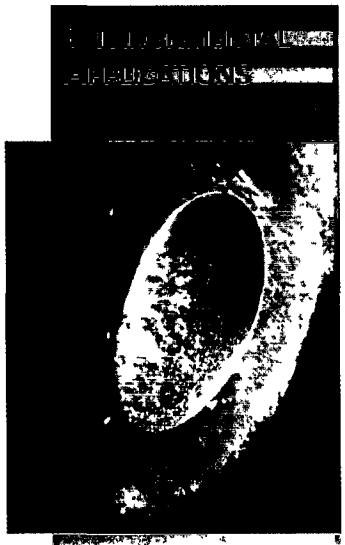
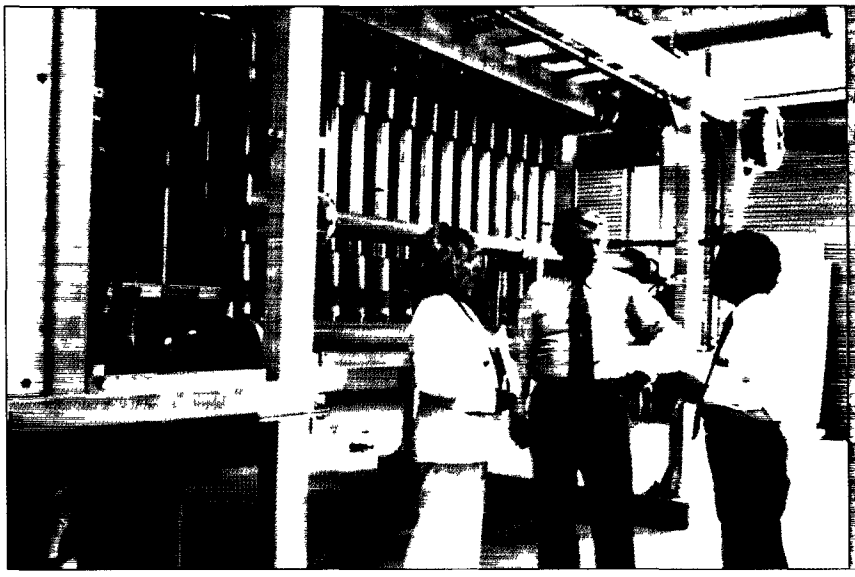
MICROFILTRATION REDUCES CHEMICAL USAGE, ENERGY COST FOR WATER DISTRICT



This process removes microscopic contaminants which sand filters with chemical additives may not effectively eliminate.



The membrane microfiltration process provides long-term affordability and efficiency

"This system helps us avoid hauling away chemical contaminated sludge and saves us the energy usage of pumps."

James H. Cline, Jr
Director of Engineering and Inspection, Cucamonga County Water District

The Cucamonga County Water District (the District) traditionally collected filtered Cucamonga Canyon surface water and transported it by gravity flow to a reservoir. At the reservoir, the water was chlorinated and put into the District's distribution system.

Recently enacted Surface Water Filtration and Disinfection Treatment regulations determined that the District could no longer use the canyon water without installing an approved treatment process Since the canyon water was a low-cost, reliable, quality source, the District opted to treat the water for continued use.

District officials learned about membrane microfiltration technology from Southern California Edison. They then initiated an engineering study which compared the potential life-cycle costs of membrane microfiltration to two-stage filtration (with and without ozone) and ultrafiltration. This study revealed the membrane system's capital and operational cost benefits, and the District chose this technology for its new treatment plant.

Not only is the District now able to meet current and projected community water needs, but the treatment process using membranes will provide an affordable and efficient system for decades to come. Read on to learn how membrane microfiltration can bring environmental benefits and energy savings to your water treatment operation.

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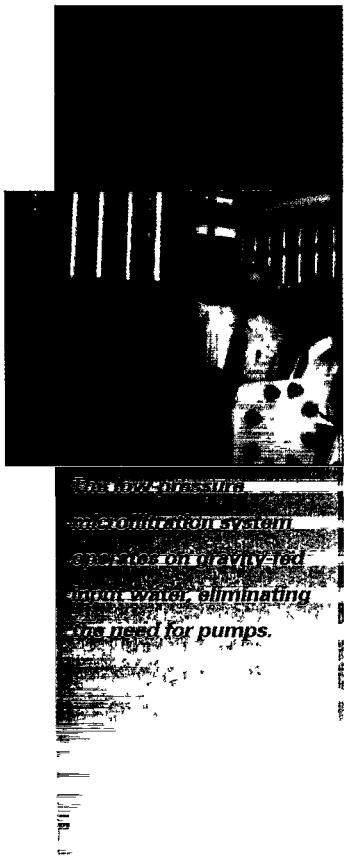

GRAVITY-FED SYSTEM DELIVERS OPERATIONAL EFFICIENCY

Membrane filtration is a pressure-driven process that uses microporous membranes with pore sizes typically ranging from 0.01 to 0.2 microns. This process filters small contaminants (including *Giardia* cysts, bacteria and viruses) that find their way into drinking water and are not handled effectively by sand filters with chemical additives.

At the District treatment plant, the canyon water first flows through 500-micron screens to remove coarse solids that could damage the membranes. The water is then filtered through the microfiltration membranes to remove the smallest contaminants. The treated water is disinfected with smaller amounts of chlorine for residual disinfection before being discharged into the distribution system.

The system discharges chemically free backwash water from the membrane units to an area adjacent to the creek for percolation. The low solids content of the water and the absence of chemical additives allows for a very low maintenance backwash discharge system.

The plant has a treatment capacity of 4 million gallons per day (mgd), expandable to an ultimate treatment capacity of 5 mgd. It is the largest water treatment plant utilizing the microfiltration process to treat a surface water source in Southern California.

BENEFITS OF MEMBRANE MICROFILTRATION

By installing the membrane system, the Cucamonga County Water District:

- Can more effectively comply with water regulations, due to the system's higher level of treatment.
- Has a system that is more cost-effective and more reliable at removing a wider range of contaminants than conventional chemical-based systems.
- Avoids the cost of pre-treating and hauling away chemical sludge.
- Benefits from significant energy savings by relying on gravity to feed input water rather than pumps. Even with the required changeout of the membrane modules every five to seven years, the system's lifetime capital and operating costs are lower than the initial capital cost of traditional pumps.

OTHER APPLICATIONS

- Wastewater reuse facilities, where secondary effluent is treated for use in irrigation and injection into the aquifer.
- Boiler feed for power generation plants, where reverse osmosis systems require water pretreatment.

FOR MORE INFORMATION
about membrane filtration for water treatment or other applications, call your Southern California Edison account executive or (626) 812-7345.
www.sce.com

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